

Abstract

TITLE OF THE ABSTRACT : A PROSPECTIVE OBSERVATIONAL STUDY COMPARING
CARDIAC FUNCTION OF SMALL FOR GESTATIONAL AGE WITH APROPRIATE FOR
GESTATIONAL AGE BABIES USING SERIAL ECHOCARDIOGRAPHIC STUDIES.

DEPARTMENT : Neonatology

NAME OF THE CANDIDATE : Dr Manish Kumar

DEGREE AND SUBJECT : DM (Neonatology) Branch XI

NAME OF THE GUIDE :DrAtanu Kumar Jana

AIM / OBJECTIVES: To evaluate the cardiac functions of term and late preterm small for gestational age(SGA) babies by serial echocardiographic measurements and compare this with term and late preterm appropriate for gestational age (AGA) babies during the early postnatal period.

MATERIAL AND METHODS: Seventy term and late preterm babies were enrolled in the study with thirty five each in the SGA and AGA groups. Babies whose birth weight was less than the 3rd percentile for that gestational age were included in SGA group and those with birth weight between 10th and 90th percentile were recruited in AGA group. Infants of diabetic mother, babies with perinatal asphyxia, major congenital malformations, congenital heart disease, anemia and babies born to mother with chorioamnionitis were excluded.

Echocardiography was performed for all babies on days 1, 2 and 3 of life with the primary outcome being to compare cardiac function, measured primarily by the myocardial performance index (MPI).

RESULTS: We found significantly higher values of MPI in both ventricles in SGA babies compared to AGA babies on all days except MPI of right ventricle on day 3. These findings suggest compromised myocardial performance in SGA babies. SGA babies had significantly increased heart rate in comparison to AGA babies during first 3 days of life. Left ventricular internal diameter index during diastole and systole (LVIDD index and LVIDS index) were significantly increased in SGA babies in comparison to AGA babies, in the first 72 hours. The ratio of LA:AO was elevated in SGA babies and the difference was statistically significant on days 1 and 2. We did not find significant differences in fractional shortening, ejection fraction, area shortening, cardiac output or superior vena caval flow between the two groups. SGA babies had lower vascular resistance in anterior cerebral artery and higher vascular resistance in celiac and superior mesenteric artery in comparison to AGA babies. There was no difference in timing of closure of ductus arteriosus in both the groups.

CONCLUSIONS: We observed in our study that volume independent parameters of cardiac function like MPI are significantly increased in SGA babies as compared to AGA babies.

However, volume dependent parameters like fractional shortening, ejection fraction, area shortening and stroke volumes are similar in both the groups. We also found higher value of left ventricle internal diameter index during diastole and systole (LVIDD index and LVIDS index) and LA:AO ratio in SGA babies in comparison to AGA babies which is suggestive of volume overload in SGA babies. It may be postulated that increased volume overload in SGA babies compensate for compromised myocardial performance by increasing cardiac contractility in response to increased preload as per Sterling's law.

Keywords: Small for gestational age, myocardial performance index, cardiac function.